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BIOLOGICAL EVALUATION
Douglas-fir Beetle

Walnut Canyon National Monument
National Park Service
Arizona

By
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On March 1, 1972, Harold Flake and Charles Germain, entomologist and biological technician, respectively, evaluated the Douglas-fir beetle population and host tree stand conditions on Walnut Canyon National Monument. Several beetle population flare-ups have occurred within and adjacent to the Monument during the past 20 years. The current flare-up may, in part, have been caused by a widespread spring drought in 1971.

Douglas-fir beetle populations were found in the trees sampled. The infested trees are on poor sites having shallow, rocky soils. The infestation can be expected to continue in 1972. Maintenance control may be necessary if aesthetic, recreational, and other resource values are adversely affected within the Walnut Canyon National Monument.

Technical Information

Insect.--Douglas-fir beetle, Dendroctonus pseudotsugae Hopk.

Host.--Douglas-fir, Pseudotsuga menziesii

Extent and Location of Damage.--The canyon contains an estimated 400 acres of susceptible host type. The outbreak is on the north and northwest facing slopes. It is confined to one pocket of infested trees on the Island Trail and to several scattered trees across the canyon. There is no Douglas-fir timber resource on the National Forest lands surrounding the Monument.

Biological Information

Methods.--Bark samples were removed from the infested trees at breast height with a $1\frac{1}{2}$" arch punch. The samples were brought to our Albuquerque laboratory for examination.

Visual observations on site quality, species composition, and age classes were made throughout the host type.

Results.--The bark samples showed a viable adult beetle population. Population measurements to quantify the beetle population were not attempted because it would entail defacing the infested trees adjacent to the scenic trail.

Visual observations show the Douglas-fir growing in mixed, uneven-aged stands on marginal sites, for the most part. The primary species are Douglas-fir, pinyon pine, ponderosa pine, and juniper. Reproduction is adequate in the areas examined.

Discussion

The evaluation data indicate that tree-killing by the Douglas-fir beetle will continue in 1972. The trend of the infestation and an accurate estimate of losses in 1972 cannot be made with the limited sampling and our knowledge of the Douglas-fir beetle biology in the Southwest. Should a spring and summer drought occur again this year, the problem could be aggravated further by reducing stand vigor.

Insect losses on marginal sites are usually more frequent and severe. The Douglas-fir beetle is host specific to Douglas-fir. Therefore, tree losses in mixed stands are usually less than in pure stands of the host type.

Recommendations

We recommend that National Park Service personnel evaluate the impact of the tree-killing as it affects the aesthetics, recreational, and other resource values within the Monument. Should your evaluation indicate suppression is warranted, two possible alternatives, or a combination of the two, are available.

1. Direct chemical treatment of the currently infested trees, using ethylene dibromide. Estimated cost is $25.00 per tree. Must be completed by May 10, 1972.

2. Post-flight treatment of trees attacked in 1972, using Silvisar 510. Timing is critical. Estimated cost is $5.00-$7.50 per tree.

We would recommend the combination approach. Both ethylene dibromide and Silvisar 510 are registered for use against the Douglas-fir beetle.

If Forest Pest Control funds are used for suppression, an environmental impact evaluation and benefit-cost evaluation are required. Our Insect and Disease Control personnel can assist National Park Service personnel in the preparation of these items and operational phases of the suppression project, should one be undertaken.

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